

CALIFORNIA TRAFFIC CONTROL DEVICES COMMITTEE (CTCDC) AGENDA

October 17, 2013 Meeting (Start Time 9 am)

Burton W. Chace Park Community Room, 13650 Mindanao Way
Marina del Rey, California 90292

The Meeting is open, and public/local agencies are invited to attend. For further information regarding this meeting, please contact Devinder Singh at (916) 654-4715, or at Devinder.singh@dot.ca.gov. Electronic copies of this meeting Agenda and minutes of the previous meetings are available at <http://www.dot.ca.gov/hq/traffops/signtech/newtech/index.htm>

Organization Items

- 1 Introduction
- 2 Membership –Election of Chairman, Vice Chairman and new membership
- 3 Approval of Minutes of the July 25th, 2013 Meetings
- 4 Public Comments

At this time, members of the public may comment on any item not appearing on the agenda. Matters presented under this item cannot be discussed or acted upon by the Committee at this time. For items appearing on the agenda, the public is invited to make comments at the time the item is considered by the Committee. Any person addressing the Committee will be limited to a maximum of five (5) minutes so that all interested parties have an opportunity to speak. When addressing Committee, please state your name, address, and business or organization you are representing for the record.

Agenda Items

5 Public Hearing

Prior to adopting rules and regulations prescribing uniform standards and specifications for all official traffic control devices placed pursuant to Section 21400 of the California Vehicle Code (CVC), the Department of Transportation is required to consult with local agencies and hold public hearings.

	Page #s
13-10 Reduced Speed Limits in TTC Zones (Proposed to amend various Sections & Figures in Part 6 of the CA MUTCD 2012) – Submitted by Caltrans	(Introduction) (Benton) 8-21

6. Request for Experimentation

13-07 Request to Experiment with Bike Boxes -Submitted by the National City	(Introduction) (Greenwood) 22-34
11-4 Experiment with Rectangular Rapid Flashing Beacon (RRFB) vs. Existing Circular Rapid Flashing Beacon (CRFB) -Final Report Submitted by the City of Santa Monica	(Continued) (Greenwood) 35-35
08-7 Experimentation with new Warning Sign for Bicyclists Staff recommends removing from the “Items Under Experimentation”	(Continued) (Brown) 36-38
06-2 Experiment with Colored Bike Lane Staff recommends removing from the “Items Under Experimentation”	(Continued) (Brown) 39-39

Information Items:

13-08 Minimum Yellow Light Change Interval Timing for signalized Intersections (update by Subcommittee Chair) (Continued)
(Bahadori

7 Discussion Items-None

8. Tabled Items:

12-20 FHWA's 2009 MUTCD Revisions 1 and 2 –Engineering Judgment & Compliance dates

9 Next Meeting - Suggested dates are January 30, 2014, or February 6 or 20th, 2014

10 Adjourn

ITEM UNDER EXPERIMENTATION

- 06-2 Experiment with Colored Bike Lane **(Proposed to remove from the agenda)** (Brown)
(Proposed by the City of San Francisco)
Status: No New Update.
San Francisco has designed and installed green thermoplastic in the dashed portions of bicycle lanes at 7 intersections. Photos of the green installation at a few locations can be viewed here: <http://sf.streetsblog.org/2012/06/22/sfmta-adding-more-green-treatments-to-bike-lane-merging-zones/>. We will be working on collecting “After” data in the next two months followed by an analysis of the data to determine if the treatment improves safe merging behavior and compliance with proper lane placement by both bicyclist and motorists.
The revised schedule for the remainder of the experiment is as follows:
August 2012 – Ongoing data collection to continue through September
October 2012 – Draft report
December 2012 – Final report
Thanks,
Darcie Lim, PE
SFMTA | Municipal Transportation Agency
One South Van Ness Avenue, 7th Floor
San Francisco, CA 94103
phone: (415) 701-4545
- 08-7 Experimentation with new Warning Sign for Bicyclists (Brown)
(Proposed to remove from the agenda) (City/Co of San Francisco)
Status: No new update. No change since their last report. The City and County of San Francisco would like to bring this experiment to a close and therefore will analyze collision data collected before and after the installation of this experimental warning sign and submit the results to the Committee within the next 12 months for its evaluation.
- 09-9 Experiment with Steady Red Stop Line Light (Greenwood)
Status: LADOT prepared a draft evaluation report which indicated that the Steady Red Stop Lights at two intersections did reduce vehicle/bus and vehicle/train conflicts based on the camera surveillance data. However, the “Control Intersections” (locations where no Steady Red Stop Lights were installed) also showed similar improvements. Further analysis of more data will be conducted in the next twelve months.
See report on the following website.
<http://www.dot.ca.gov/hq/traffops/signtech/newtech/status.htm>
- 09-21 Experiment with Separated/Protected Bikeway (Greenwood)
On the Left Side of Two One-Way Streets in the City of Long Beach (Rte 9-112E)
Status: **No new update.** See report on the following website.
<http://www.dot.ca.gov/hq/traffops/signtech/newtech/status.htm>
- 10-3 Experiment with Second Train Warning Sign “Additional Train May Approach” with a Symbol Sign (Submitted by City of Riverside) (Greenwood)
Status: See report on the following website:
http://www.dot.ca.gov/hq/traffops/signtech/newtech/exp/Item10-3_AdditionalTrainMayApproachSign.pdf

- | | | |
|-------|---|-------------|
| 11-3 | Experiment with Buffered Bicycle Lanes on 2 nd St.between Bayshore & PCH in Naples
Status: No update. | (Greenwood) |
| 11-12 | Experiment with Circular Rapid Flashing Beacon and RRFB
Status: No update. | (Greenwood) |
| 11-13 | Experiment with a Sign “RECKLESS DRIVING PROHIBITED”
Status: No update. | (Winter) |
| 11-19 | Experiment with 2 nd advance California Welcome Center Destination Sign
Status: No update. | (Benton) |
| 12-9 | Request to Experiment with Yellow LED Border on Pedestrian Signal
Status: See report on the following website:
http://www.dot.ca.gov/hq/traffops/signtech/newtech/exp/Item12-9_YellowLEDBorderPedSignal.pdf | (Benton) |

Status: (9-11-13) Since my last status update in June, we have continued to collect before/after video at the 2nd and 3rd study locations. Also, we have been reviewing the videos and collecting data as time allows, but it has been a fairly slow process. This will definitely be the most time consuming part of the experiment. As noted in the evaluation plan, we are reviewing the five intersections for seven consecutive days in both the before and after scenarios. Considering we are counting pedestrians and turning traffic over a 16 hr. period each day, the total number of hours of video that will be reviewed is 1120. I think I will need to recruit more help!

Here is a quick summary of where we stand at each location:

1. Churn Creek Rd/Hartnell Ave - before and after video data collected (reviews started)
2. Shasta Street/ Pine Street - before and after video data collected (reviews started)
3. Eureka Way/Market Street - before video data collected, after video collection began yesterday (9/10)
4. Market Street/ Shasta Street - before video data: target mid-late September
5. Market Street/Tehama Street - before video data: target mid-late September

Let me know if you have any questions. Thanks.

Rob Stinger, P.E.

Chief - Traffic Engineering & Operations
Caltrans District 2
530-225-3229

- 12-18 Request to experiment with Red Colored Transit-only Lanes (SF) (Patterson)
Status: (9-13-13) San Francisco installed red transit-only lanes in March, 2013 on Church Street between 16th Street and Duboce Avenue (see attached photo). We are monitoring this durability of the material and effects on transit and traffic. This location did not have transit-only lanes prior to the red material installation. We are undergoing planning and design work for 3 other proposed experimental installations, but they will likely not be installed until spring 2014 due to the need to make pavement repairs prior to installation.



Dustin White
Transportation Planner

 SFMTA | Municipal Transportation Agency
One South Van Ness Avenue, 7th Floor
San Francisco, CA 94103
415.701.4603

- 12-19 Request to Experiment with Highlighted Shared Lane Markings (LA City) (Bahadori)
Status: No update
- 12-21 Request to Experiment with In-Roadway Warning Lights (IRWL) System that would supplement existing traffic signals along the Metro Gold Line (LA Metro) (Winter)
Status: No update
- 12-25 Request for permission to experiment with various Bicycle Treatments (Santa Monica) (Winter)
Status: See report on the following website:
http://www.dot.ca.gov/hq/traffops/signtech/newtech/exp/Item12-25_VariousBikeTreatments-SantaMonica.pdf
- 13-01 Request to Experiment with Green & Shared Roadway Bicycle Markings – Proposed by the City of Oakland (Patterson)
Status: (9-11-13) Data collection to document the existing condition was completed during the week of Sunday, April 28, 2013. Stage #1 construction (installation of standard treatments) was completed on July 19, 2013. Data collection for the Stage #1 condition (standard treatments) was completed over the week ending August 20, 2013. Stage #2 construction (installation of the experimental green band) is currently in progress. Data collection for the Stage #2 condition (experimental treatment) is anticipated in October 2013.

Jason Patton, PhD**Bicycle & Pedestrian Program Manager**

Transportation Planning & Funding Division

Department of Engineering & Construction

City of Oakland | Public Works Agency | APWA Accredited Agency

250 Frank H. Ogawa Plaza, Suite 4344 | Oakland, CA 94612

(510) 238-7049 | (510) 238-7415 Fax

jpatton@oaklandnet.com

- 13-02 Request to Experiment with Bike Boxes and Wide Bike Strip Stripe (Patterson)
-Proposed by the City of Davis
Status:(9-11-13)The City of Davis just awarded the contract for this project and will be holding the pre-construction meeting this week. Construction will start shortly thereafter, with completion planned for January 2014.

I would like to remind you that Wide Bike Strip Stripe is not part of the experiment as we are not precluded from using the 12-inch line under the national CAMUTCD.

Thank you,

Roxanne Namazi**Senior Civil Engineer**

City of Davis Public Works

23 Russell Boulevard

Davis, CA 95616

(530) 757-5675

Rnamazi@cityofdavis.org Web: WWW.cityofdavis.org

13-10 Reduced Speed Limits in TTC Zones (Proposed to amend various Sections & Figures in Part 6 of the CA MUTCD 2012)**Recommendation:**

Caltrans request that the Committee recommend adoption of the proposed changes needed to address reduced speed limits in temporary traffic control zones per the proposal below.

Requesting Agency & Sponsor: Caltrans

Background:

Caltrans Construction Partnering Steering Committee's Work Zone Safety Task Group and the California Strategic Highway Safety Plan's Challenge Area 14 (Enhance Work Zone Safety) initiated the proposed change. Safety in highway work zones is an area of emphasis for Caltrans (California Department of Transportation). Therefore many improvements in work zone safety are being implemented. One of these improvements is the increased use of speed limits to control vehicle speeds through highway work zones. Proper and uniform application of these speed limits should improve the safety of the highway workers and the traveling public.

There is a need for addressing two scenarios of speed reductions in TTC zones, one for long term speed reductions when there is lane shift, narrow lanes, or other geometric constraints and the second scenario is for short term speed reduction when geometrics are not an issue but concerns for workers safety due to no physical barrier separation. Current California MUTCD addresses these two scenarios with separate sign packages primarily due to past practice and sign size issues. This has led to confusion with practitioners not aware of the distinction between the two packages and their intended use. This proposal simplifies the sign package to only one type of device for both scenarios as the intended response from road users is essentially the same regardless of the scenario for which the device is used. The proposal also provides additional guidelines for short duration traffic control in work zones at the request of Caltrans Maintenance.

This proposal also deletes the current reference to Engineering and Traffic Survey (E&TS) requirement as an E&TS is not required for reducing speeds in TTC zones. TTC speed limits do not fall under the definition of the Speed Trap and can be enforced with radar or lidar without a formal E&TS

California MUTCD 2012 Proposed Policy (Reduced Speed Limits in TTC zones): Please note that the black and blue text is existing policy and the changes are shown in red colored text.

Section 6C.01 Temporary Traffic Control Plans

Support:

⁰¹ A TTC plan describes TTC measures to be used for facilitating road users through a work zone or an incident area. TTC plans play a vital role in providing continuity of effective road user flow when a work zone, incident, or other event temporarily disrupts normal road user flow. Important auxiliary provisions that cannot conveniently be specified on project plans can easily be incorporated into Special Provisions within the TTC plan.

⁰² TTC plans range in scope from being very detailed to simply referencing typical drawings contained in this Manual, standard approved highway agency drawings and manuals, or specific drawings contained in the contract documents. The degree of detail in the TTC plan depends entirely on the nature and complexity of the situation.

Guidance:

⁰³ *TTC plans should be prepared by persons knowledgeable (for example, trained and/or certified) about the fundamental principles of TTC and work activities to be performed. The design, selection, and placement of TTC devices for a TTC plan should be based on engineering judgment.*

⁰⁴ *Coordination should be made between adjacent or overlapping projects to check that duplicate signing is not used and to check compatibility of traffic control between adjacent or overlapping projects.*

⁰⁵ *Traffic control planning should be completed for all highway construction, utility work, maintenance operations, and incident management including minor maintenance and utility projects prior to occupying the TTC zone. Planning for all road users should be included in the process.*

⁰⁶ *Provisions for effective continuity of accessible circulation paths for pedestrians should be incorporated into the TTC process. Where existing pedestrian routes are blocked or detoured, information should be provided about alternative routes that are usable by pedestrians with disabilities, particularly those who have visual disabilities. Access to temporary bus stops, travel across intersections with accessible pedestrian signals (see Section 4E.09), and other routing issues should be considered where temporary pedestrian routes are channelized. Barriers and channelizing devices that are detectable by people with visual disabilities should be provided.*

Option:

⁰⁷ Provisions may be incorporated into the project bid documents that enable contractors to develop an alternate TTC plan.

⁰⁸ Modifications of TTC plans may be necessary because of changed conditions or a determination of better methods of safely and efficiently handling road users.

Guidance:

Standard:

⁰⁹ This alternate or modified plan ~~should~~ shall have the approval of the Engineer of the public agency or authority having jurisdiction over the highway ~~responsible highway agency~~ prior to implementation.

Guidance:

¹⁰ *Provisions for effective continuity of transit service should be incorporated into the TTC planning process because often public transit buses cannot efficiently be detoured in the same manner as other vehicles (particularly for short-term maintenance projects). Where applicable, the TTC plan should provide for features such as accessible temporary bus stops, pull-outs, and satisfactory waiting areas for transit patrons, including persons with disabilities, if applicable (see Section 8A.08 for additional light rail transit issues to consider for TTC).*

Reduced Speed Limits in TTC Zones

¹¹ Provisions for effective continuity of railroad service and acceptable access to abutting property owners and businesses should also be incorporated into the TTC planning process.

¹² Reduced speed limits should be used only in the specific portion of the TTC zone where conditions or restrictive features are present. However, frequent changes in the speed limit should be avoided. A TTC plan should be designed so that vehicles can travel through the TTC zone with a speed limit reduction of no more than 10 mph.

¹³ A reduction of more than 10 mph in the speed limit should be used only when required by restrictive features in the TTC zone. Where restrictive features justify a speed reduction of more than 10 mph, additional driver notification should be provided. The speed limit should be stepped down in advance of the location requiring the lowest speed, and additional TTC warning devices should be used.

¹⁴ Reduced speed zoning (lowering the regulatory speed limit) should be avoided as much as practical because drivers will reduce their speeds only if they clearly perceive a need to do so.

Standard:

^{14a} ~~The justification for the reduced speed limit shall be documented in writing, in satisfaction of the Engineering and Traffic Survey (E&TS) requirement. Refer to CVC 627 for E&TS. Refer to CVC 21367 & 22362 (reason for deletion is that it is not in compliance with Section 2B.13 & CVC 21367 & 22362 as speeds can be reduced without E&TS)~~

Option:

²⁵ Reduced speed limits in construction zones may be established by an engineering analysis, which may include a traffic and engineering survey. *(moved here)*

Support:

¹⁵ Research has demonstrated that large reductions in the speed limit, such as a 30 mph reduction, increase speed variance and the potential for crashes. Smaller reductions in the speed limit of up to 10 mph cause smaller changes in speed variance and lessen the potential for increased crashes. A reduction in the regulatory speed limit of only up to 10 mph from the normal speed limit has been shown to be more effective.

Support:

¹⁶ See Section 2B.13 for ~~permanent~~ Regulatory Speed Limit signs and Speed Zones signs.

¹⁷ See Section 6F.12 for Road Work/Speed Zone (C17(CA)) sign, WORK ZONE (G20-5aP) plaque and END WORK ZONE SPEED LIMIT (R2-12) sign.

~~Construction Speed Zones:~~

~~¹⁸ Construction speed zones are established on roads under construction where reduced speed is necessary to limit the risk of an accident to workers and the traveling public during all hours of the day and night. Refer to CVC Section 21367. Protection of workers during working hours is provided for under CVC Section 22362.~~

~~CVC section 22362 gives the agency having jurisdiction over a highway the authority to regulate the speed of traffic to provide protection for workers when at work on the roadway or within the right-of-way so close thereto as to be endangered by passing traffic.~~

~~CVC Section 21367 gives the agency having jurisdiction over a highway the authority to regulate the speed of traffic whenever the traffic would endanger the safety of workers or the work would interfere with or endanger the movement of traffic through the area.~~

Guidance:

~~The need for a long-term reduced speed limit within a TTC zone should be a decision made during the project development process. The need for a short-term reduced speed limit within a TTC zone, such as a maintenance activity, should be determined in advance of planned maintenance activities.~~

Option:

~~If lowering speed limits for a short-term, such as a maintenance activity, signs lowering the speed limit by 10 mph may be placed in work zones that are not protected by a positive barrier and involve workers on foot or on equipment.~~

Guidance:

~~19 Construction Reducing speed zones limits in TTC zones should be avoided if traffic speeds can be controlled reduced by other means. Speed restrictions should be imposed on the public only when necessary for worker or public safety.~~

Standard:

20 Where traffic obstructions exist only during the hours of construction, the speed zone signs shall be covered during non-working hours.

Support:

21 CVC 22362 applies to "When Workers are Present" condition and signs need to be covered or removed when no work is in progress. As per CVC 21367, agency can "...regulate the movement of traffic...whenever the traffic would endanger the safety of workers or the work would interfere with or endanger the movement of traffic through the area." If obstructions would be present throughout the project duration the signs would not need to be covered or removed. This would also apply to situations where the construction work changes the highway configuration, curvature or elevation, making it necessary to post reduced speed limits.

Guidance:

~~22 The traveled way should be signed and delineated to communicate physical conditions to the motorists such as curvature, narrow roadways, detours, rough roads, dips or humps, etc.~~

Option:

23 The Advisory Speed (W13-1) plaque may be used in combination with various warning type signs to decrease speed at a particular location.

Guidance:

24 To preserve the effectiveness of the W13-1 plaque, it should not be used unless the condition to which it applies is immediate and will be experienced by all motorists.

Option:

~~25 Reduced speed limits in construction zones may be established by an engineering analysis, which may include a traffic and engineering survey. (moved from here)~~

Guidance: (Need to verify source)

26 Construction zone speed limits should be reduced in sequential stages and where overall reduction of 15 mph or more is required. The first stage of the sequence should be a reduction of 10 mph and the final stage reduction should be 10 mph or 5 mph, as necessary.

Standard:

27 **The reduced speed limit shall not be less than 25 mph. Refer to CVC 22362.**

Option: *(Refer to #26 for need and to modify)*

28 As an example, if the project falls within an established 55 mph zone, and a 40 mph speed limit is considered necessary, it may be posted only if the approaching speed limits are lowered in two stages (i.e., first to a 45 mph speed limit followed by a reduction to the desired 40 mph).

Guidance:

~~29 Speed Limit and End Zone signs should be installed at locations jointly agreed upon by the Traffic Engineer and the Construction Engineer.~~

Support:

~~30 Orders for construction speed zones~~ Documentation for reducing speed limits in TTC zones are ordinarily issued for the entire length of the ~~construction~~ TTC zones in a project. This avoids the necessity and resulting delay of obtaining a new ~~order~~ documentation each time the speed restriction signs require relocation to fit the conditions. It is not the intention, however, that the entire length be posted for the duration of the ~~contract~~ project.

Standard:

31 Speed ~~restriction~~ limit signs for reduced speed limits shall be posted only in areas where the traveling public is affected by ~~construction~~ TTC operations.

Guidance:

32 As the ~~construction~~ TTC zone activities change ~~progresses~~, signs should be moved as appropriate.

Standard: *(move to Section 6F.12)*

33 Signs shall be used only during working hours and removed, or covered during non-working hours unless the movement of traffic through the TTC zone is affected during non-working hours as well. Refer to CVC 21367.

³⁴ Signs shall be removed immediately following completion of the construction or change in the conditions for which they were installed. When the construction is completed or the speed restriction is no longer necessary, the formal speed zone orders shall be revoked.

Section 6F.12 Work Zone and Higher Fines Signs and Plaques

Option:

⁰¹ A WORK ZONE (G20-5aP) plaque (see Figure 6F-3) may be mounted above a Speed Limit (R2-1X(CA)) sign (TTC version of R2-1 with top half orange or orange border) to emphasize that a reduced speed limit is in effect within a TTC zone. An END WORK ZONE SPEED LIMIT (R2-12) sign (see Figure 6F-3) may be installed at the downstream end of the reduced speed limit zone.

Guidance:

⁰² A BEGIN HIGHER DOUBLE FINES ZONE (R2-10) sign (see Figure 6F-3) should be installed at the upstream end of a work zone where increased fines are imposed for traffic violations, and an END HIGHER DOUBLE FINES ZONE (R2-11) sign (see Figure 6F-3) should be installed at the downstream end of the work zone.

Option:

⁰³ Alternate legends such as BEGIN (or END) DOUBLE FINES ZONE may also be used for the R2-10 and R2-11 signs.

⁰⁴ A ~~FINES HIGHER~~, FINES DOUBLE, or ~~\$XX FINE~~ plaque (see Section 2B.17 and Figure 6F-3) may be mounted below the Speed Limit sign if increased fines are imposed for traffic violations within the TTC zone.

⁰⁵ Individual signs and plaques for work zone speed limits and higher fines may be combined into a single sign or may be displayed as an assembly of signs and plaques.

⁰⁶ The TRAFFIC FINES DOUBLED IN CONSTRUCTION ZONES (C40(CA)) and TRAFFIC FINES DOUBLED IN WORK ZONES (C40A(CA)) signs may be placed approximately 500 feet in advance of the first required TTC sign(s). The placement of the C40(CA) and C40A(CA) signs is at the discretion of the responsible person(s) in charge of the work zone.

Support:

⁰⁷ Refer to CVC 42009 for fines for offenses committed in highway construction or maintenance area. In California, as per CVC only doubling of the fines is allowed, not higher fines of other denominations.

Guidance:

⁰⁸ The C40A(CA) sign is intended to be manufactured as a fabric sign and should be used on a short term (daily) basis only. Longer term situations should use the C40(CA) sign.

Support:

⁰⁹ CVC 22362 applies to "When Workers are Present" condition and signs need to be covered or removed when no work is in progress. However, per CVC 21367, agency can "...regulate the movement of traffic...whenever the traffic would endanger the safety of workers or the work would interfere with or endanger the movement of traffic through the area." If obstructions would be present throughout the project duration the signs would not need to be covered or removed. This would also apply to situations where the construction work changes the highway configuration, curvature or elevation, making it necessary to post reduced speed limits.

Option:

~~¹⁰ A WORK ZONE (G20-5aP) plaque may be mounted above a Speed Limit sign to emphasize that a permanent (24 hours a day, 7 days a week) reduced speed limit is in effect within a TTC zone. An END WORK ZONE SPEED LIMIT (R2-12) sign (see Figure 6F-3) may be installed at the downstream end of the reduced speed limit zone.~~

¹¹ The ~~Read Work/Speed Limit (C17(CA)) sign~~ Speed Limit (R2-1X(CA)) sign (TTC version of R2-1 with top half orange or orange border) may be used for the protection of workers during working hours to reduce speed limit within a TTC zone.

Standard:

¹² The ~~C17(CA) sign~~ Speed Limit (R2-1X(CA)) sign (TTC version of R2-1 with top half orange or orange border) shall only be used in conjunction with appropriate advance warning signs.

¹³ The ~~C17(CA) sign~~ Speed Limit (R2-1X(CA)) sign (TTC version of R2-1 with top half orange or orange border) shall be removed or covered promptly when no longer applicable.

Support:

¹⁴ The ~~C17(CA) sign~~ Speed Limit (R2-1X(CA)) sign (TTC version of R2-1 with top half orange or orange border) is authorized for use by CVC Section 22362. This section provides authority to post a speed limit of not less than 25 mph at locations where employees of any contractor, or of the agency in charge of the job, are engaged in work upon the roadway.

¹⁵ Posting unrealistically low speed limits will result in loss of sign credibility and a high violation rate.

Guidance:

¹⁶ Before using a ~~C17(CA) sign~~ Speed Limit (R2-1X(CA)) sign (TTC version of R2-1 with top half orange or orange border), work zone conditions should be analyzed to determine what maximum speed limit would be appropriate for that particular location.

¹⁷ The ~~C17(CA) sign~~ Speed Limit (R2-1X(CA)) sign (TTC version of R2-1 with top half orange or orange border) should be placed within 400 feet of the zone where workers are on the roadway or so nearly adjacent as to be endangered by traffic.

Option:

¹⁸ The ~~C17(CA) sign~~ Speed Limit (R2-1X(CA)) sign (TTC version of R2-1 with top half orange or orange border) may be provided by the agency having jurisdiction over the street or road.

Guidance:

¹⁹ The ~~C17(CA)~~ Speed Limit (R2-1X(CA)) sign (TTC version of R2-1 with top half orange or orange border) should be posted a maximum distance of 400 feet in advance of where, and when workers are present; and the Speed Reduction (W3-5) sign or Speed Zone Ahead (R2-4(CA)) sign informs road users of the reduced speed limit TTC zone.

California MUTCD 2012 Edition
(FHWA's MUTCD 2009 Edition, as amended for use in California)

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Figure 6F-3. Regulatory Signs and Plaques in Temporary Traffic Control Zones
(Sheet 1 of 2)

Speed Limit R2-1 sign is deleted and replaced with (R2-1X(CA)) sign (TTC version of R2-1 with top half orange)

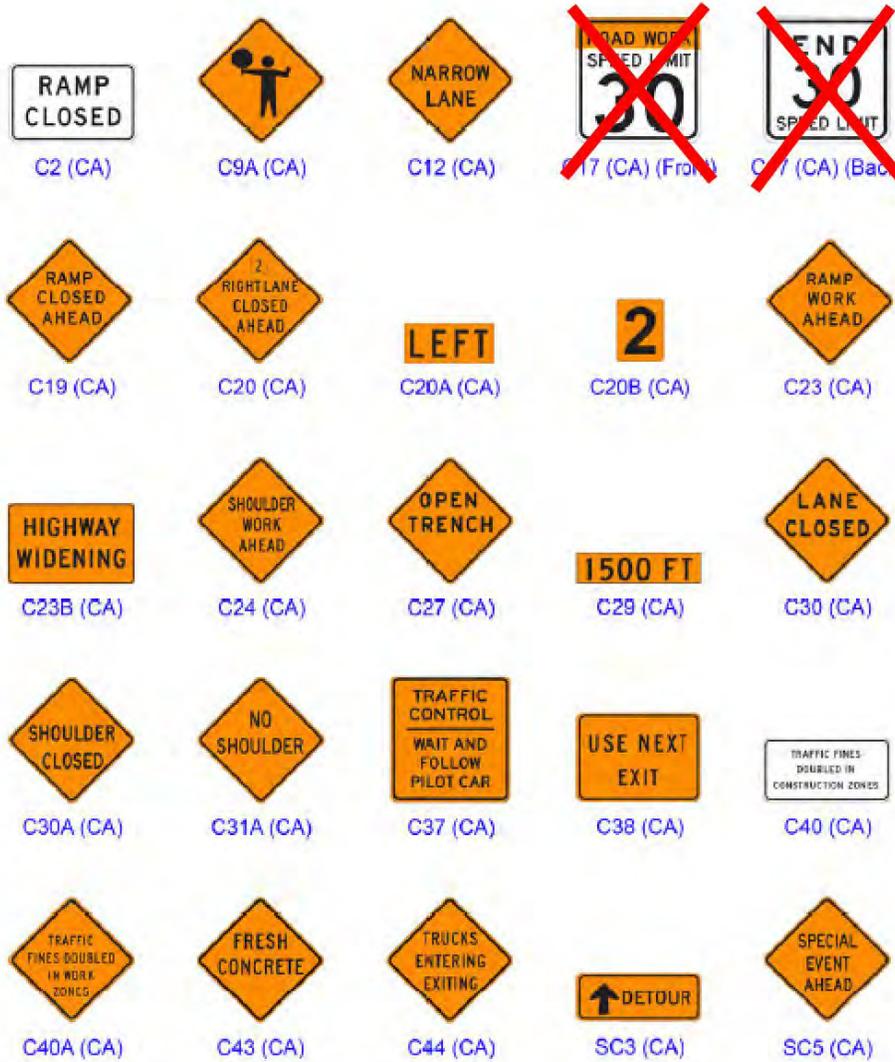


Figure 6F-3. Regulatory Signs and Plaques in Temporary Traffic Control Zones
(Sheet 1 of 2)

Speed Limit (R2-1X(CA)) sign (TTC version of R2-1 with top half orange)



Figure 6F-101 (CA). California Temporary Traffic Control Signs
 (Sheet 1 of 2)



STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

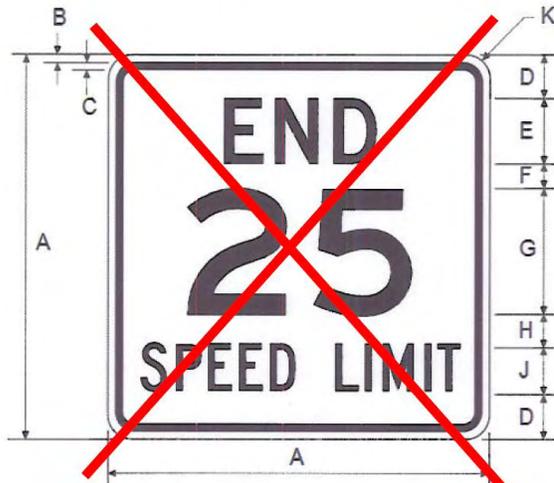


C17 (CA)

ENGLISH UNITS

A	B	C	D	E	F	G	H	J	K
24	.375	.625	2.5	3C	.75	1.5	10D	2.5	1.5
36	.625	.875	3.75	4.5C	1.5	2.75	13.3D	4.25	2.25
48	.75	1.25	5	6C	2.5	4	16D	6	3

COLORS: BORDER & LEGEND - BLACK
 BACKGROUND - ORANGE (RETROREFLECTIVE) & WHITE (RETROREFLECTIVE)



Optional Backside for C17 (CA)

ENGLISH UNITS

A	B	C	D	E	F	G	H	J	K
24	.375	.625	2.75	4D	1.5	8D	2	3C	1.5
36	.625	.875	4	6D	2.75	12D	2.75	4.5C	2.25
48	.75	1.25	5.5	8D	3.5	16D	3.5	6C	3

COLORS: BORDER & LEGEND - BLACK
 BACKGROUND - WHITE (RETROREFLECTIVE)

NOTE: When using back-to-back and one side is not applicable, that side shall be covered.

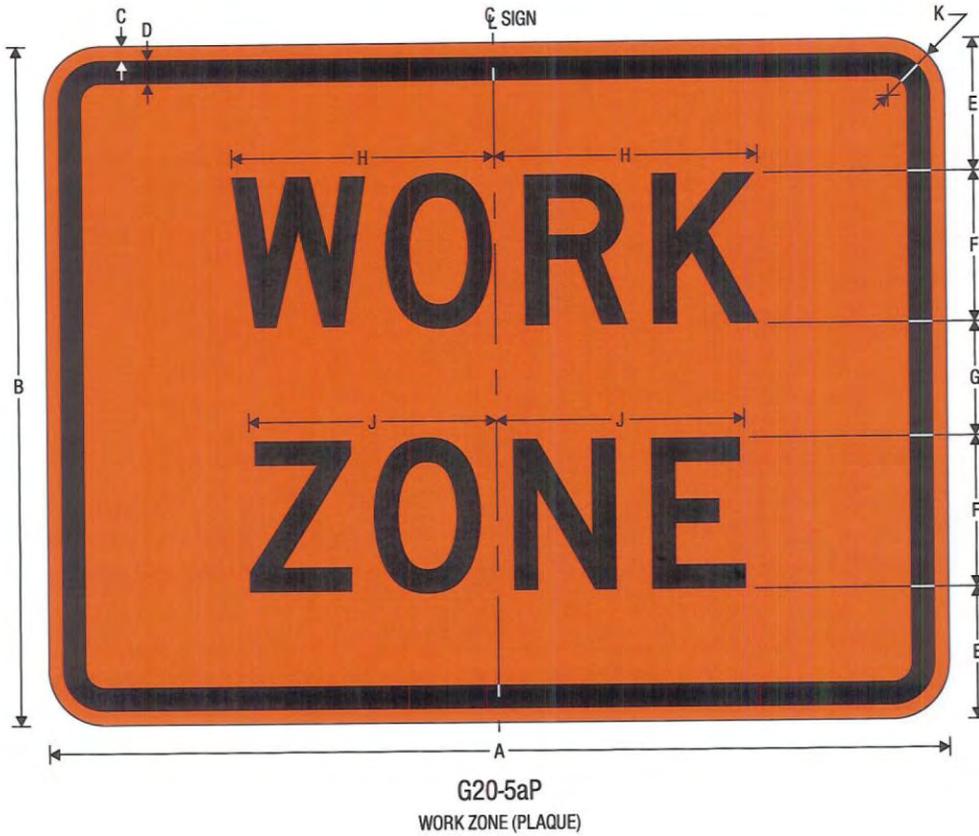


R2-1
SPEED LIMIT (ENGLISH)

*Optically space numerals about centerline

	A	B	C	D	E	F	G	H	J	K	L
	18	24	.375	.625	3	3 E	2	8 E	7.188	5.5	1.5
C	24	30	.375	.625	4	4 E	2	10 E	9.563	7.313	1.5
	36	48	.625	.875	6	6 E	5	14 E	14.375	11	2.25
	48	60	.75	1.25	8	8 E	6	16 E	19.125	14.625	3

COLORS: LEGEND — BLACK
BACKGROUND — WHITE (RETROREFLECTIVE)



A	B	C	D	E	F	G	H	J	K
24	18	0.375	0.625	3.5	4 D	3	7.005	6.605	1.5
36	24	0.375	0.625	4.125	6 D	3.75	10.507	9.907	1.5
48	36	0.625	0.875	7	8 D	6	14.009	13.209	2.25

COLORS: LEGEND, BORDER — BLACK
BACKGROUND — ORANGE (RETROREFLECTIVE)



~~R2-1~~
SPEED LIMIT (ENGLISH)

*Optically space numerals about centerline

	A	B	C	D	E	F	G	H	J	K	L
	18	24	.375	.625	3	3 E	2	8 E	7.188	5.5	1.5
C	24	30	.375	.625	4	4 E	2	10 E	9.563	7.313	1.5
	36	48	.625	.875	6	6 E	5	14 E	14.375	11	2.25
	48	60	.75	1.25	8	8 E	6	16 E	19.125	14.625	3

COLORS: LEGEND — BLACK
BACKGROUND — WHITE (RETROREFLECTIVE)



R2-1
SPEED LIMIT (ENGLISH)

*Optically space numerals about centerline

C

A	B	C	D	E	F	G	H	J	K	L
18	24	.375	.625	3	3 E	2	8 E	7.188	5.5	1.5
24	30	.375	.625	4	4 E	2	10 E	9.563	7.313	1.5
36	48	.625	.875	6	6 E	5	14 E	14.375	11	2.25
48	60	.75	1.25	8	8 E	6	16 E	19.125	14.625	3

COLORS: LEGEND — BLACK
BACKGROUND— WHITE (RETROREFLECTIVE)

6. Requests for Experimentations

13-07 Request to Experiment with Bike Boxes

Recommendation:

The National City requests authorization from the Committee to conduct experiment with Bike Boxes.

Agency Making Request: National City

Sponsor: Mark Greenwood –Voting Member, representing LOCC, Southern California



May 31, 2013

Mr. Bruce Friedman
Office of Transportation Operations, HOTO
Federal Highway Administration
1200 New Jersey Avenue, SE
Washington, DC 20590

Mr. Devinder Singh
Executive Secretary
California Traffic Control Devices Committee – MS36
P.O. Box 942874
Sacramento, CA 94274-0001

Subject: Request for Permission to Experiment – National City (Bike Boxes)

Mr. Friedman and Mr. Singh:

The City of National City requests permission to experiment with Bike Boxes at various signalized intersections throughout the city.

Background:

With the exception of the 2.42-mile section Sweetwater River Bikeway, the regional Class I bike path that runs parallel to Highway 54 on the southern border of the city, National City has very few designated bicycle facilities. According to the National City Bicycle Master Plan, the City's existing bicycle network consists of 1.71 miles of Class II bike lanes and a 0.59-mile segment of Class III bike route. The existing bicycle facilities locations are shown in **Figure 1**.

The National City Bicycle Master Plan seeks to rectify the lack of bicycle facilities and provide bicycle encouragement, awareness, enforcement, and parking along key corridors within the community. The City collaborated with the public through workshops, surveys, bicycle tours and City Council working meetings to identify corridors within the City where bicycle facilities should be implemented. A project ranking criteria was established in order to prioritize the implementation of these facilities. **Figure 2** shows the ranking criteria used in developing the prioritization list. **Figure 3** illustrates the final prioritization list of projects. As shown in **Figure 3**, 4th Street, 18th Street, 30th Street and D Avenue were ranked as top priority project for implementation.

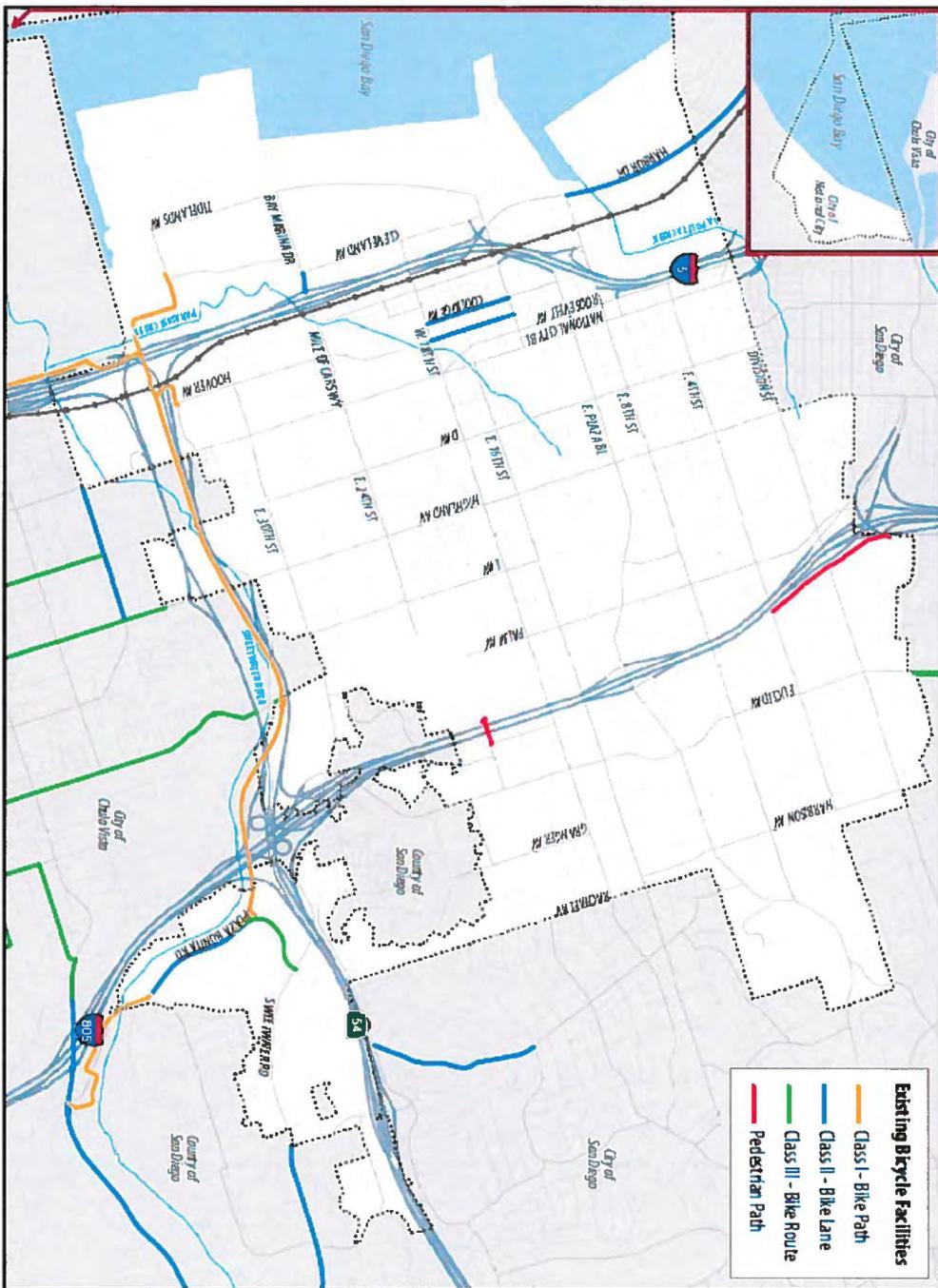
National City collaborated with Kimley-Horn and Associates to create project improvement plans for 4th Street, 18th Street, 30th Street and D Avenue. **Figures 4 to 6** illustrate the proposed improvements along these corridors.

The City applied for and received Active Transportation Grants from the San Diego Association of Governments (SANDAG) to construct Class II and Class III bicycle facilities, including bicycle detector loops and bicycle boxes at signalized intersections along these corridors. The City also received a grant to provide bicycle parking enhancements throughout the City.

Engineering Department
1243 National City Boulevard, National City, CA 91950-4301
619/336-4380 Fax 619/336-4397 www.nationalcityca.gov



Figure 1: Existing Bicycle Facilities in National City



Source: Figure 3-1: Existing Bicycle Facilities in National City, City of National City Bicycle Master Plan, City of National City (2010)

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Figure 2: Project Ranking Criteria

Criteria	Description	Points
Bicycle Propensity Model Results	The results from the bicycle propensity model will be used to assist in ranking the various bikeway projects. Bikeways that serve areas that scored the highest in the bicycle propensity model will receive the most points, whereas bikeways that serve areas with low model results will receive minimal points for this evaluation criteria.	0 to 20
Collisions / Safety	This ranking is based on SWITRS data identifying corridors with a high number of bicycle collisions within a quarter mile buffer. The greater the number of collisions per mile, the greater the need to provide safety enhancements. Numbers of collisions per project mile will be calculated for all bikeways based on the following formula: [(# of collisions per mile/highest # of collisions per mile)*10]. Projects will be scored on a scale ranging from zero to ten.	0 to 10
Public Input	Projects identified by the public as important at public meetings and by communications with the City staff will receive ten points for this criteria. Projects are scored by either a "yes", they have received public comment, or "no", they have not.	Yes=10 No=0
Staff Input	Projects identified by City staff as key initiatives will receive ten points for this criteria. If not identified as a key initiative, the project will receive zero points for this criteria.	Yes=10 No=0
Project Feasibility	Project Cost: Project cost affects the ability of the City to construct the bikeway. Projects that are lower cost have higher scores. Projects are scored based upon the following five cost ranges: A: \$0-\$50,000 B: \$50,001-\$125,000 C: \$125,001-\$400,000 D: \$400,001-\$1,000,000 E: Greater than \$1,000,000	A=5 B=4 C=3 D=2 E=1
	Parking impacts: Parking displacement affects the ability of the City to construct the bikeway. If a proposed bikeway project has no parking impacts it receives five points, and if the project displaces parking it receives zero points.	Yes=5 No=0
Local Connections	Projects that connect to existing or proposed bikeways in National City will receive ten points for this criteria. Projects are scored by either a "yes" or "no".	Yes=10 No=0
Regional Connections	Projects that connect to existing or proposed neighboring city, county or regional bikeways will receive ten points for this criteria. Projects are scored by either a "yes" or "no".	Yes=10 No=0
	Maximum Potential Overall Score:	80

Source: Table 5-4: Project Ranking Criteria, City of National City Bicycle Master Plan, City of National City (2010)

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Figure 3: Project Prioritization

Priority Level	Location	From	To	Class	Miles	Total Points
Early Action	Harbor Drive / Tidelands Avenue / 32 nd Street (Bayshore Bikeway)	Northern City Limit	Marina Way (Sweetwater River Bikeway)	1	2.3	
Early Action	Interstate 805 Corridor	Northern City Limit	12 th Street	1	1.1	-
Early Action	Plaza Bonita Road	Sweetwater River Bikeway	Bonita Mesa Road	1	0.4	
Tier 1	Marina Way	Bay Marina Drive	32 nd Street	1	0.5	66.4
Tier 1	18 th Street	Wilson Avenue	Palm Avenue	2	1.3	65.7
Tier 1	4th Street	Roosevelt Avenue	Harbison Avenue	2	2.0	64.7
Tier 1	D Avenue	4th Street	32nd Street	2	1.8	60.4
Tier 1	30 th Street	Hoover Avenue	Highland Avenue	3	0.7	58.6
Tier 1	18th Street	Palm Avenue	Granger Avenue	3	0.8	57.7
Tier 1	Highland Avenue	30th Street	Southern City Limit	2	0.5	57.0
Tier 1	Harbor Drive	8th Street	Civic Center Drive	2	0.3	54.8
Tier 1	D Avenue	Division Street	4 th Avenue	3	0.2	51.5
Tier 1	Hoover Avenue / 33rd Street / National City Boulevard	Mile of Cars Way	Southern City Limit	2	1.2	51.4
Tier 1	8 th Avenue	Roosevelt Avenue	Paradise Valley Road	3	2.3	50.6
Tier 2	Roosevelt Avenue	Main Street	8 th Street	2	0.5	49.5

Source: Table 5-6: Project Prioritization, City of National City Bicycle Master Plan, City of National City (2010)

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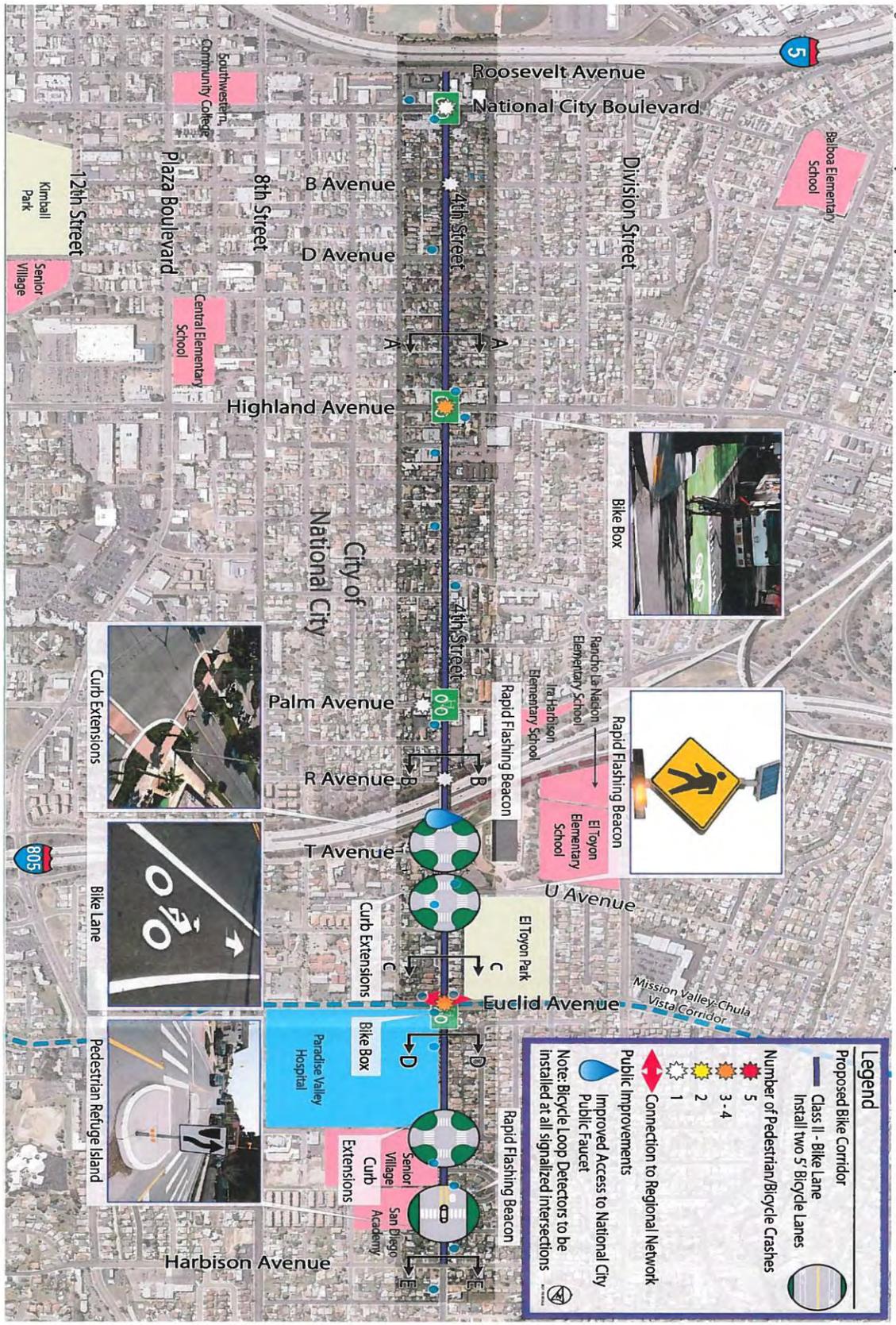


Figure 4: 4th Street Community Corridor Project Improvement Map

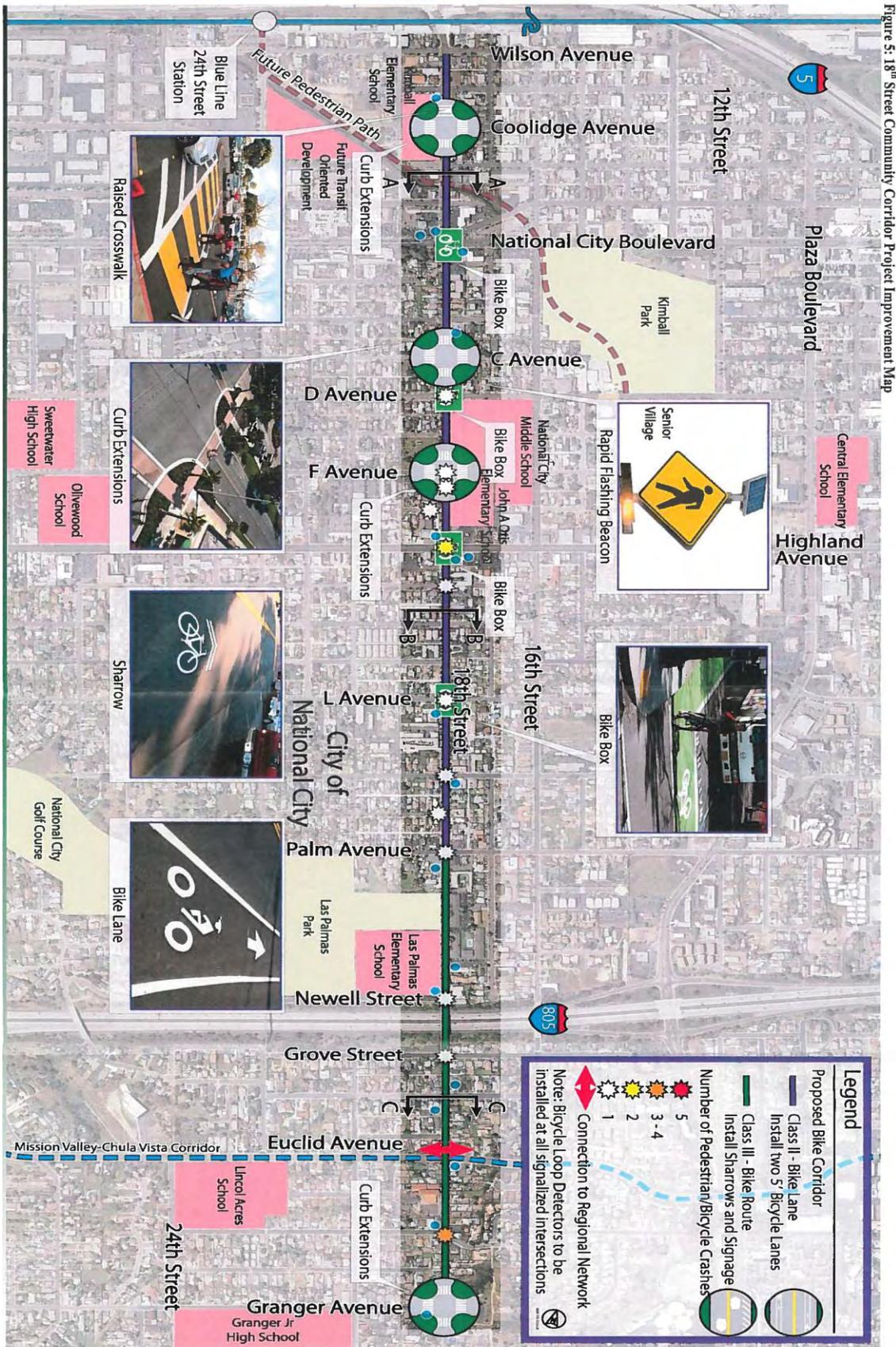
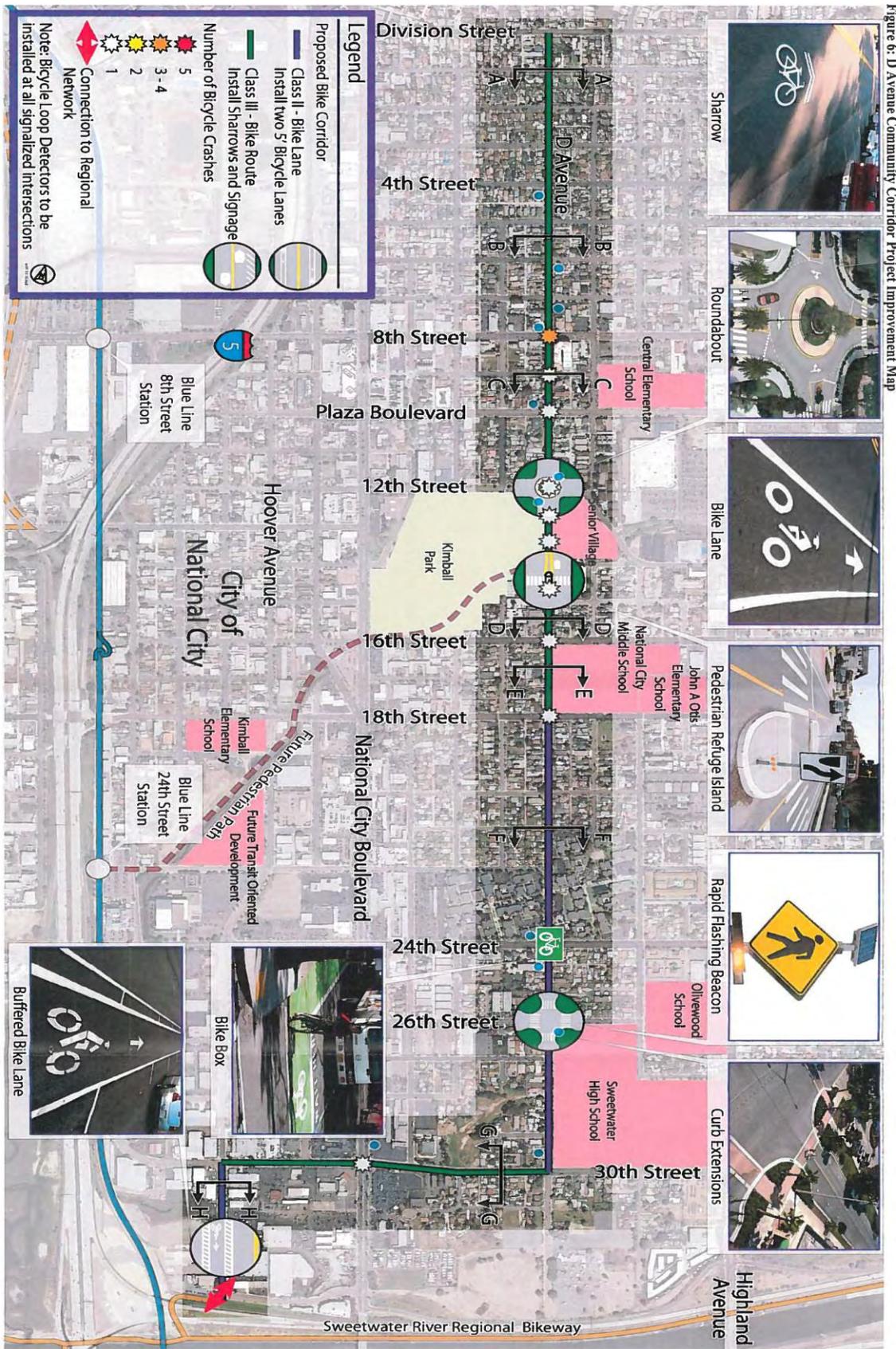


Figure 5: 18th Street Community Corridor Project Improvement Map

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Problem Statement:

As National City is proposing to add approximately 6.5 miles of Class II and Class III bicycle facilities to corridors that do not currently have designated bicycle facilities, drivers will need to adjust to an increase in bicycle activity. As such, improving bicyclist visibility to reduce the risk of bicycle-vehicular collisions is a high priority. These priorities are consistent with the goal of the National City Bicycle Master Plan to create a safe and comprehensive local and regionally connected bikeway network where bicycling is a viable travel choice for users of all abilities.

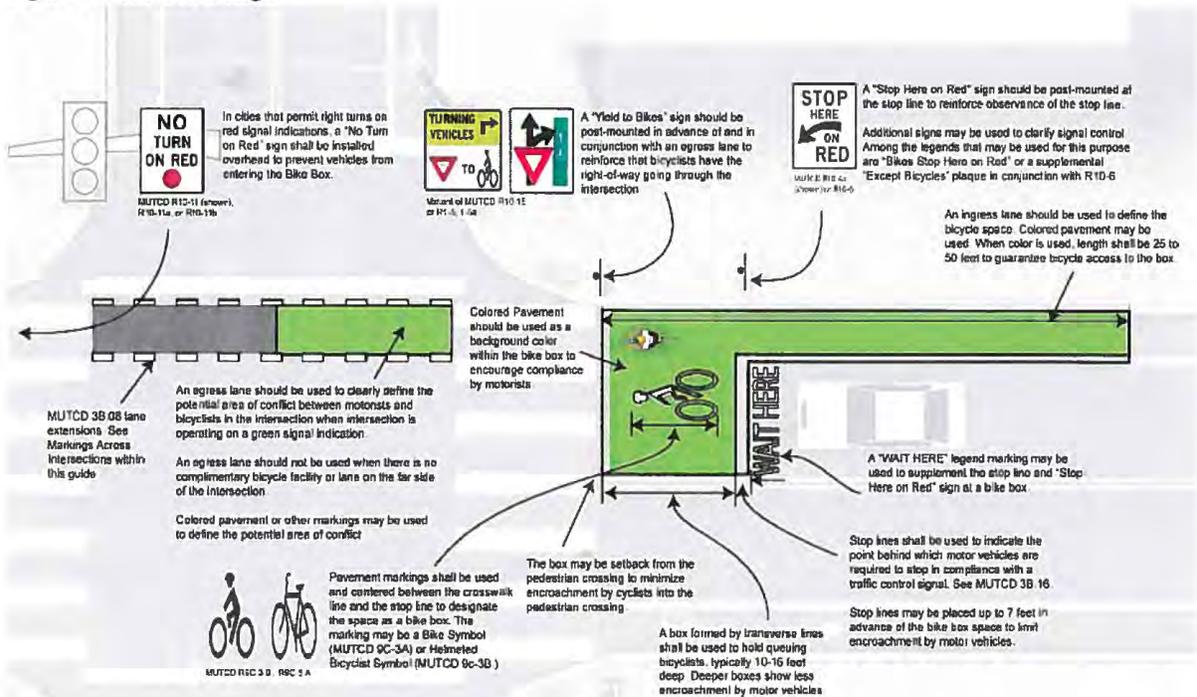
Proposed Changes:

In order to increase bicyclist visibility and make bicycling a safe and viable travel choice for users of all experience levels, Bike Boxes are proposed at signalized intersections along each of the corridors where Class II bike lanes are proposed.

According to the National Association of City Transportation Officials (NACTO), “a Bike Box is a designated area at the head of a traffic lane at a signalized intersection that provides bicyclists with a safe and visible way to get ahead of queuing traffic during the red signal phase” (*NACTO Urban Bikeway Design Guide*, April 2011). Bike Boxes are intended to increase the visibility of bicyclists by positioning them ahead of stopped vehicles. Bike Boxes are also intended to help prevent right-hook conflicts with right-turning vehicles and can be useful in aiding bicycle queuing.

The proposed Bike Box design, as recommended by NACTO, is shown in **Figure 7**. As can be seen, the application of color and markings in the area between the limit line and the crosswalk line to designate an exclusive waiting area for bicyclists causes the Bike Box design to deviate from the standards contained in the California Manual on Uniform Traffic Control Devices (CA-MUTCD). **Figures 8 and 9** show the Bike Box design detail and a typical intersection with the Bike Box design as prepared for the National City 4th Street Corridor Improvement Plans. The proposed Bike Box design is not protected by a patent or copyright. This detail will be applied to each corridor.

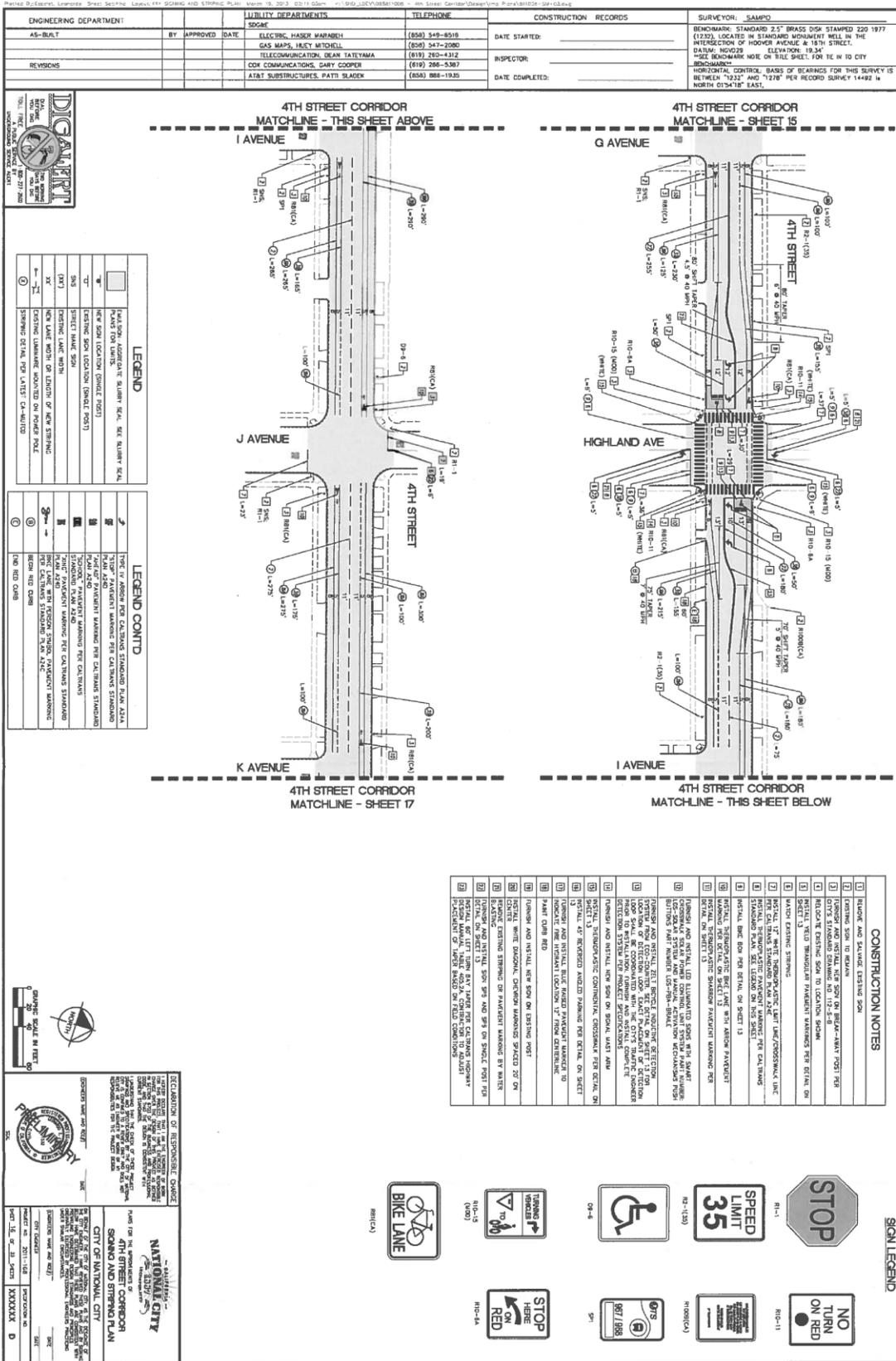
Figure 7: Bike Box Design



Source: http://nacto.org/wp-content/uploads/2010/08/BikeBox_Plan_Annotated.jpg

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Figure 9: Typical Intersection with Bike Box Design as Presented in the National City 4th Street Corridor Improvement Plans



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Proposed Locations:

The requested Bike Boxes are proposed at the following signalized intersections:

- Along 18th Street where it intersects the following roadways:
 - National City Boulevard
 - D Avenue

- Along 4th Street where it intersects the following roadways:
 - National City Boulevard
 - Highland Avenue
 - Palm Avenue
 - Euclid Avenue

- Along D Avenue where it intersects 24th Street.

Evaluation Plan:

The objective of the experiment is to evaluate the effectiveness of the Bike Box design. National City will conduct before and after studies consistent with SANDAG's data collection requirements. The City will provide semi-annual progress reports for the duration of the experiment to the Federal Highway Administration (FHWA) and the California Traffic Control Devices Committee (CTCDC) and will provide a copy of the final results to the FHWA within three months of the completion of the experiment. The City's target construction date is Fall of 2013. The experiment will last as long as the City deems necessary for proper collection of data. The City of National City agrees to terminate the experiment if the City, the FHWA, or CTCDC determines that significant safety concerns are directly or indirectly attributable to the experiment. If necessary, the City will restore the site of the experiment to a condition that complies with the provisions of the CA-MUTCD within three months of the termination of the experiment. The City understands that if a request is made that the CA-MUTCD be changed to include the proposed Bike Box design, the experimental design will be permitted to remain in place until an official rulemaking decision has been made.

Some of the measures that will be observed to evaluate the Bike Boxes include:

- Vehicle compliance with the No Turn on Red requirement
- Proportion of vehicles encroaching into the Bike Box
- Position of bicyclist within the lane and Bike Box
- Bicycle and vehicle collision type and frequency, with particular emphasis on right-hook conflicts
- Traffic counts of vehicles and bicycles
- Bicycle ridership type mix
- Speed of bicycles and vehicles

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Conclusion:

The City of National City desires to provide bicycle facilities that will make bicycling a more practical and convenient transportation option for a wide variety of residents with various skill-levels and reasons for bicycling. Should the results of this experiment conclude that the Bike Box designs have been effective and successful in improving bicycle safety and enhancing bicyclists' experience, the FHWA and CTCDC should consider creating a guideline for these types of traffic control devices in a future revision of the CA-MUTCD.

We look forward to receiving approval for our request of permission to experiment with Bike Boxes. If you have any questions or require additional information, please don't hesitate to contact me.

Sincerely,



Stephen Manganiello
City Engineer
City of National City
Engineering Department
smanganiello@nationalcityca.gov
619-336-4382

7.

11-4 Experiment with Rectangular Rapid Flashing Beacon vs. existing Round Rapid Flashing Beacon

See Final Report has been on the following website.

[http://www.dot.ca.gov/hq/traffops/signtech/newtech/exp/2013-04-24_Final_rpt_4\(09\)-8.pdf](http://www.dot.ca.gov/hq/traffops/signtech/newtech/exp/2013-04-24_Final_rpt_4(09)-8.pdf)

08-7 Experimentation with new Warning Sign for Bicyclists

Action: Staff recommends that this item be removed from the “Items Under Experimentation”.

Background: The warning sign experimentation 08-7 should be dropped. The BICYCLISTS WATCH FOR ILLEGAL RIGHT TURNS warning sign will be removed in the coming weeks as the City and County of San Francisco prepare to activate an automated enforcement system. In general the collision problem it warned persisted after its installation so it wasn’t effective enough.

The City and County of San Francisco received authorization to conduct experimentation with either of the following two signs:

FIGURE 1



24” with 2” lettering
Black Text on Yellow Background

When the Committee authorized the experiment, they stated that this experiment is a for a unique intersection in the City of San Francisco and if experiment is successful, this sign should not be included in the CA MUTCD, because there are no other locations in California similar to this one.

See Committee comments below during the hearing of this item:

MOTION: Moved by Deborah Wong suggested to authorize experimentation with either of the signs included in the agenda packet.

Hamid Bahadori stated that he would second the motion if his amendment were included. His amendment was that the Committee's intent is not to include these signs in the CA MUTCD, the purpose of the signs is to address one isolated location in one city.

Chairman Mansourian commented that he would suggest the city to consider doing experimentation with the proposed signs and also by merging the bike lane with regular traffic and see which one works better. As Hamid Bahadori stated before, the problem is only for one particular intersection and the Committee does not want these signs to be adopted statewide. He added that his suggestion is not part of the motion, however, it is a request to the city to consider comments made by the Committee members and by the public.

John Fisher stated that this is a single isolated problem that is unique for a particular location and it is not a statewide problem. When the Committee is approached for an experimentation request and the Committee authorizes experimentation for a single location to accommodate the jurisdiction to help them to find a solution of the problem. After three years, the results come back and the agency asks the Committee to develop standards which are applicable statewide. He added that he is not in favor to adding signs to the CA MUTCD, which are not applicable statewide. He suggested that if the Committee considers experimentation then it should be compared with other available tools. They may be more expensive, such as an electric LED "No Right Turn" sign, and consider bicycle lead signal phase.

John Fisher stated that he would like to make a friendly amendment that authorizes the experimentation with the signs as well as also test electric LED "No right Turn" signs at the intersection and in advance, and also evaluate providing a bicycle lead signal phase. Then the city analyzes which device works more effectively.

Chairman Mansourian asked Deborah Wong and Hamid Bahadori if they agreed with John Fisher's amendment and would like to make motion. He also asked Jack Fleck if it is acceptable to him.

Both Deborah Wong and Hamid Bahadori agreed with the amendment suggested by John Fisher. In addition, Jack Fleck stated that the city would consider other tools available.

Steve Lerwill commented that this is one location which has a particular problem that is not a statewide issue, the Committee is approving a sign for one particular location and after three years if the sign is proven effective, would the Committee adopt as a statewide standards?

Chairman Mansourian responded that the part of the motion is that the sign will not be included in the CA MUTCD even it is proven to be effective at this location. He further added that the cities and counties that have problems to provide adequate safety, they come to the Committee. It is the Committee's responsibility to try to help them within the parameters of the CA MUTCD.

Chairman Mansourian asked Deborah Wong and Hamid Bahadori to revise their motion.

MOTION: Moved by Deborah Wong, seconded by Hamid Bahadori, authorize experimentation with signs as requested by the City/County of San Francisco. In addition, to compare other devices such as electric LED “No Right Turn” signs and bicycle leading signal phase to see which device is more effective. In the end, if signs are proven successful, they will not be included in the CA MUTCD because they are for an isolated location.

Motion carried 8-0

The City and County of San Francisco agreed for the removal of this item from the “Items Under Experimentations”.

Note: If you want read the complete CTCDC discussion on this item, please visit on the following website and read pages 27 thru 30 of the January 30, 2008 meeting minutes:

<http://www.dot.ca.gov/hq/traffops/signtech/newtech/minutes/Min013108.pdf>

06-2 Experiment with Colored Bike Lane

Action: Staff recommends that this item be removed from the “Items Under Experimentation”.

Background: The City and County of San Francisco received approval from the Committee to conduct experimentation with green bike lanes during the February 2, 2006 meeting. On April 15, 2011, the Federal Highway Administration (FHWA) issued Interim Approval for Optional Use of Green Colored Pavement for Bike Lanes (IA-14), and subsequently Caltrans received blanked approval from the FHWA for the use of green bike lanes statewide.

The IA issued by FHWA does not require further data collection, and the City and County of San Francisco is not obligated to collect further data. In addition, they have not submitted any data since the IA approval. **Therefore, staff recommends that this item be removed from the “Items Under Experimentation”.** However, Caltrans encourages the City and County of San Francisco to submit data to the CTCDC in case it is beneficial to approve the federal policy.

9. Next Meeting: Suggested dates are January 30, 2014 or February 6 or 20th, 2014.

10. Adjourn: